30th Congress, 1st Session. [SENATE.] Rep. Com., No. 135.

IN SENATE OF THE UNITED STATES.

April 19, 1848.
Submitted, and ordered to be printed.

Mr. Dix, made the following

REPORT:

The Committee on Commerce, to whom was referred the memorial of G. R. Cox, and ninety-four others, passengers on board steamboat Yorktown, on the Mississippi river, March 17, 1848, *report:*

That, in the opinion of the memorialists, "security and safety for the lives and property of the travelling community demand the passage of a law, which shall compel the owners or captains of all steam vessels to have placed on each outside boiler, Evans's safety guard to prevent explosion."

The committee understand that the invention of Mr. Evans consists of a tube closed at the lower end, inserted into the steam chamber of the boiler, and containing a small quantity of fusible alloy, which melts at a temperature below that at which the steam would be dangerous. The melting of the alloy unsolders a support permitting the opening of the safety valve, or causing an alarm to be sounded. Fusible alloy has been used in France for many years, in the form of plates soldered into the boiler, but the application in Mr. Evans's invention, as will be seen by the foregoing description, is essentially different. Some fifteen years ago experiments were made by the Franklin Institute, in Philadelphia, in respect to the fusibility of plugs or plates composed of alloys of lead, tin, and bismuth at a given temperature and pressure; and they resulted in showing striking differences in the metals thus combined, in regard to their respective points of fusion, the more fusible melting or becoming partially liquefied so as to be forced out of the plates, while the less fusible remained in a solid state, thus producing great uncertainty as to the temperature and pressure at which the whole mass became liquid. These perplexities had previously led to the suggestion by Professor A. D. Bache, the chairman of the committee to whom the experiments were entrusted, of enclosing the fusible metal in a tube sase, so as to prevent it from being exposed to the pressure of the cteam and leaving it only to be acted upon by heat.

The committee understand Mr. Evans's patent, of which there are several, to have been taken out subsequently to these experi-

ments, and they have doubtless been endowed by the inventor with all the advantages which were afforded by previous experience. His first patent, for the application of fusible alloys to steam boilers, was granted in 1834. In 1839, he obtained another, depending upon the same principle, but applied in a variety of forms; and in 1845, he obtained a third, depending upon the expansive power of metals to indicate the condition of the boiler.

These inventions, like many others, having the same great object of preventing explosions, are before the public and under the inspection of the scientific portion of the community, and are thus undergoing the rigid scrutiny to which competition is sure to subject all improvements in the application of the mechanical powers to practical uses. Several of these inventions have been brought before the committee, through the reference of other memorials to them, and through the investigations to which those memorials have led, into the causes of steam explosions, and the proper remedies for them. Some of these inventions consist of alarm floats within the boilers, connected with external indexes by which the height of the water is designed to be shown, not only to the engineer, but to the passengers, and with valves which are opened for the escape of the steam by the action of the float in its descent, as the supply of water becomes deficient. If the object in view could be effectually and certainly accomplished, one of the most common causes of explosion would be exposed. How far they are to be successful can only be shown by a more enlarged experience.

There are other inventions in common use, having in view the same general purpose, depending on the vigilance of the engineer rather than on the action of natural agents, such as the ordinary guage cock, which gives no indication of the state of the boiler until it is examined and tested.

Whether any one, or all of these inventions combined, would afford a perfect security against the fatal explosions which have become so common, especially on our western waters, without the perpetual vigilance of experienced, skilful, and careful engineers, the committee are not prepared to say. Nor can they learn that any one of them possesses, in the public estimation, such a decided superiority over all the others as to warrant them in recommending, as the memorialists ask in respect to Mr. Evans's invention, that Congress should make its adoption by steam vessels a matter of compulsory legislation. It is, undoubtedly, exceedingly desirable that a never failing "sleepless guardian" should be found, acting by the force of natural laws, and remedying the inexperience and unfaithfulness of engineers, to preside over the thousands of lives and the millions of property which are, every day in the year and every hour in the day, committed with unshaken confidence, in spite of perpetually recurring disasters, to the custody of the proprietors and engineers of steam vessels; a confidence which should be met on the part of the former by the employment of skilful engineers, and on the part of the latter by watchfulness over the sources of danger to which they are exposed. The committee can only hope that such a security may,

through the investigations of the scientific and the experiments of the practical mechanician, be found. And in the meantime they are of opinion that the subject must be left to the public competition, which, in a matter so intimately interwoven with private interests, will be very sure to indicate a preference wherever it is justly due, and in which the interference of Congress might be productive both of public injury and private injustice.

On the other kindred references alluded to, the committee hope to be able to report at an early day; and in the meantime they ask to be discharged from the further consideration of the memorial.